

REMARKS

By the present amendment, claim 1 has been amended to incorporate therein the features of claims 2 and 9, to recite that the electric motor is of the three-phase type, that the battery is connected to the external power source via a connector of the vehicle adapted to cooperate with a complementary connector of the external power source, that the means acting as a rectifier and operating as an inverter acts as a rectifier for the charging of the battery from the electric motor, and that the means acting as a rectifier and operating as an inverter is disposed between the battery and the switch, so as to act as a rectifier to charge the battery from the external power source when the switch is in the second position in which the battery is connected with the external power source.

Support for the added recitations is found in the original application, for example, page 5, paragraph 0034, pages 6-7, paragraphs 0041 and 0045, and Figs. 7-8.

Accordingly, claims 3 and 5-8 have been amended to depend on claim 1. Also, claim 4 has been amended to replace “via an intermediary of” by “via.”

New claim 13 dependent on claim 5 has been added to recite that the filtering circuit is integrated within the vehicle and located between the switch and the connector. Support for the added recitation is found in the original application, for example, page 7, paragraph 0042 and Fig. 7.

New claim 14 dependent on claim 5 has been added to recite that the filtering circuit is not onboard the vehicle and is located between the external power source and the complementary

connector of the external power source. Support for the added recitation is found in the original application, for example, page 7, paragraph 0044 and Fig. 8.

Claims 1, 3-8 and 10-14 are pending in the present application. Claim 1 is the only independent claim.

Priority Claim

As a preliminary, it is noted that receipt of the priority document is not acknowledged in the Office Action summary.

An acknowledgment of the claim for priority and receipt of the priority document is respectfully requested.

Art Rejection

In the Office Action, claims 1-12 are rejected under 35 U.S.C. 103(a) as obvious over US 6,792,259 to Parise ("Parise"). It is alleged in the Office Action that using an automatic switch or a mechanical switch is "within the skill of a worker in the art" (Office Action at page 2).

Reconsideration and withdrawal of the rejection is respectfully requested.

Parise focuses on wirelessly charging an electric vehicle continuously while the vehicle is moving. Thus, Parise needs the electric motor to be functioning simultaneously with the wireless charging operation. Accordingly, Parise does not identify, let alone provide any guidance regarding problems such as electromagnetic interferences during fast-charging of an electric vehicle at a fixed location.

In contrast, an important objective of the present invention is to use a high-power three-phase network, for example, available in a charging station, to enable fast charging of a battery, for example, in the order of 10 minutes, i.e., about the time to fill up with conventional fuel.

In the presently claimed invention, the battery is connected, on the one hand, to an electric machine, and on the other hand, to a connection that can link the battery with an external three-phase network, for example, via a plug ("plug-in").

In the first configuration (normal operation of a hybrid or electric vehicle), the battery is usually 12V, 24V, or even 48V, and is connected to the electrical machine which is supplied from the battery via a power circuit that makes it possible to transfer energy from the battery to the electrical machine – the electrical machine then operates as a motor - and from the electrical machine to the battery – the electrical machine then operates as a generator.

The electrical machine is usually a three-phase electrical machine and a power circuit 18 is used between the battery 16 and the electrical machine 14 to convert the DC current from the battery into a three-phase AC current, as in the exemplary embodiment illustrated on Figure 1 of the present application.

According to the presently claimed invention, it is required to cut the connection between the battery and the electrical machine when the vehicle is connected to an external three-phase network for fast charging the battery, as in the exemplary embodiments illustrated on Figures 2 and 4.

As illustrated on Figure 4, the connection between the electrical machine and the battery is cut downstream of the power circuit 18, which may be exemplified by the inverter 70 as

shown on Figure 7. In this setup, fast-charging of the battery is possible through high power three-phase current through the same inverter 70 that is used when the electrical machine operates as a generator to charge the battery by supplying a DC charging current to the battery. Thus, the inverter 70 allows (i) a simplification of the power chain, since it is used for charging the battery from the electrical machine in a first position of the switch and from the external supply network in a second position of the switch, and (ii) an improved electrical isolation between the external three-phase network and the electrical machine, and more specifically, the switch 50 permits isolating the electronic power circuit 18, 70 from the electrical machine 14, so as to reduce or eliminate electromagnetic parasitic noises within the vehicle caused by the electrical machine.

In particular embodiments, the use of a power circuit with transistors and diodes makes it possible to use a simple switch controlled, either by the contact key or by the male plug when it is connected with the female counterpart to connect to the external triphased network. In short, the setup as in the presently claimed invention allows fast-charging of the battery supplying the electrical machine while reducing or avoiding electromagnetic perturbations occurring in a hybrid or electric vehicle.

Parise is completely silent concerning a switch disposed between a connection to an external three-phase network and the battery and between the battery and the electrical machine. Indeed, Parise does not even identify the problem of parasitic electromagnetic interferences generated by the electrical machine, whereas similar or corresponding interferences might actually be expected to disturb the reception of the wireless signal and power beam of Parise.

Further, it is submitted that a person of ordinary skill in the art would not have found any guidance or incentive in Parise on how to connect an electrical or hybrid vehicle to an external three-phase network for fast-recharge of the battery, let alone how to design a setup capable of passing high power currents during fast-recharge from an external three-phase supply network while ensuring good insulation, especially since the switch is connected to the electrical machine which generates parasitic noises.

In summary, Parise fails to teach or suggest means for charging the battery are arranged such as to permit charging via a three-phase supply network, when a switch is in a position in which the battery is connected with the external power source via a connector of the vehicle adapted to cooperate with a complementary connector of the external power source, the connection between the motor and the battery being interrupted when the switch is in the second position, as recited in present claim 1.

Furthermore, Parise fails to teach or suggest a setup in which means acting as a rectifier for the charging of the battery from the electric motor and operating as an inverter when the electric motor is supplied by the battery is disposed between the battery and the switch, so as to act as a rectifier to charge the battery from the external power source when the switch is in the second position in which the battery is connected with the external power source, as recited in present claim 1, let alone advantages of such setup such as improved isolation of the three-phase *recherché* circuit from interferences from the electrical machine and/or simplification of the construction with use of a same inverter for charging the battery from the electrical machine in a

first position of the switch and from an external three-phase power source in the second configuration. Therefore, the present claims are not obvious over Parise.

In addition, with respect to the dependent claims, it is submitted that Parise fails to teach or suggest the combined features of each of these respective claims.

In particular, with respect to claim 7, Parise is focused on transmitting a power beam while the vehicle is being powered on and is moving, so Parise fails to teach or suggest a switch that is adapted to a recharge through an electric outlet of the vehicle, let alone a switch that is an integral part of an electric outlet located in the vehicle and being configured to cooperate with a complementary outlet of a network, the switch automatically assuming the second position when the electric outlet of the vehicle is cooperating with the complementary outlet of the network, as recited in present claim 7.

With respect to claims 5 and 13-14, Parise is completely silent regarding a problem to external recharging circuit because of interferences originating from an electric motor, let alone a solution of providing filtering means for isolating the external power source from electromagnetic interferences generated onboard the vehicle, as recited in present claims 5 and 13-14.

Therefore, each of the dependent claims, and in particular, each of claims 7, 5, and 13-14, is not obvious over Parise.

In view of the above, it is submitted that the rejections should be withdrawn.

Conclusion

In conclusion, the invention as presently claimed is patentable. It is believed that the claims are in allowable condition and a notice to that effect is earnestly requested.

In the event there is, in the Examiner's opinion, any outstanding issue and such issue may be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to our Deposit Account No. 502759.

Respectfully submitted,

/nicolas seckel/

Nicolas E. Seckel
Attorney for Applicants
Registration No. 44,373

Nicolas E. Seckel
Patent Attorney
1250 Connecticut Avenue NW Suite 700
Washington, DC 20036
Tel: (202) 669-5169
Fax: (202) 822-1257
Customer No.: 29980
NES/rep